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10/581,316	06/02/2006	Walter David Braddock IV		3859

OSEMI, INC. 7590 06/23/2009  
250 HIGHWAY 19  
RED WING, MN 55901

EXAMINER

GRAMAGLIA, MAUREEN

ART UNIT	PAPER NUMBER
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1792

MAIL DATE	DELIVERY MODE
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06/23/2009

PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

# Office Action Summary

**Application No.**

10/581,316

**Applicant(s)**

BRADDOCK, WALTER DAVID

**Examiner**

Maureen Gramaglia

**Art Unit**

1792

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 02 June 2006.  
2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.  
3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-18 is/are pending in the application.  
4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.  
5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.  
6) ☒ Claim(s) 1-18 is/are rejected.  
7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.  
8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☒ The specification is objected to by the Examiner.  
10) ☒ The drawing(s) filed on 02 June 2006 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).  
11) ☒ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☐ All b) ☐ Some \* c) ☐ None of:  
1. ☐ Certified copies of the priority documents have been received.  
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)  
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)  
3) ☒ Information Disclosure Statement(s) (PTO/CDC)  
4) ☐ Interview Summary (PTO-413)  
5) ☐ Notice of Informal Patent Application  
6) ☐ Other: \_\_\_\_\_  
Paper No(s)/Mail Date \_\_\_\_\_

## **DETAILED ACTION**

### ***Oath/Declaration***

1. The oath or declaration is defective. A new oath or declaration in compliance with 37 CFR 1.67(a) identifying this application by application number and filing date is required. See MPEP §§ 602.01 and 602.02.
2. The wording of an oath or declaration cannot be amended. If the wording is not correct or if all of the required affirmations have not been made or if it has not been properly subscribed to, a new oath or declaration is required. The new oath or declaration must properly identify the application of which it is to form a part, preferably by application number and filing date in the body of the oath or declaration. See MPEP §§ 602.01 and 602.02.
3. The oath or declaration is defective because:  
It does not identify the mailing address of each inventor. A mailing address is an address at which an inventor customarily receives his or her mail and may be either a home or business address. The mailing address should include the ZIP Code designation. The mailing address may be provided in an application data sheet or a supplemental oath or declaration. See 37 CFR 1.63(c) and 37 CFR 1.76.

### ***Specification***

4. **The disclosure is objected to because of the following informalities:** At Page 8, Line 10 of the Specification, the number "2." should be deleted. Additionally, Page 8, Line 10 of the Specification should be amended so as not to refer to claim 1, since the text of claim 1 may change during prosecution.

Appropriate correction is required.

***Claim Objections***

5. **Claims 2, 4, 5, 6 and 14 are objected to because of the following informalities:** The word "non-porous" in Line 2 of Claim 2 is misspelled. In Line 1 of Claim 4, either word "from" or the word "of" should be deleted. It appears Line 2 of Claim 4 was intended to recite "a ceramic layer comprising *a material such as...*" In Line 1 of Claim 5, either the word "from" or the word "of" should be deleted. It appears Line 2 of Claim 5 was intended to recite "*an* insulating ceramic such as..." The word "combinations" in Line 2 of Claim 6 is misspelled. Claim 13 is missing a period at the end of the claim. Claim 14 appears twice in the claim listing. Appropriate correction is required.

***Claim Rejections - 35 USC § 112***

6. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

7. **Claims 1-18 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.**

Specifically, Line 5 of Claim 1, Line 6 of Claim 17, and Line 5 of Claim 18 each recite "a plurality of insulators". It is unclear from the claim whether this recitation refers to a plurality of *thermal* insulators, or to a plurality of *electrical* insulators. For the purposes of the following examination on the merits, these recitations have been interpreted to refer to electrical insulators in accordance with the Specification, which at Page 5, Lines 18-19 recites that the plurality of insulators keep the heat shield from

electrically shorting the filament. Claims 2-16 are rejected at least due to their dependence on Claim 1.

Regarding Claims 4 and 5, the phrase "such as" renders the claims indefinite because it is unclear whether the limitations following the phrase are part of the claimed invention. See MPEP § 2173.05(d). For the purposes of the following examination on the merits, these claims have been interpreted as requiring that the ceramic coating be a material specifically recited in the claim.

Claim 6 recites the limitation "the cylindrical heat shield" in Line 1. There is insufficient antecedent basis for this limitation in the claim. Claim 7 recites the limitation "said cylindrical heat shield" in Line 1. There is insufficient antecedent basis for this limitation in the claim. For the purposes of the following examination on the merits, these claims have been interpreted as requiring that the heat shield is cylindrical.

***Claim Rejections - 35 USC § 103***

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

9. **Claims 1, 2, 3, 9, 10, 13, 14 and 16-18 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent 4,553,022 to Colombo in view of U.S. Patent 4,239,955 to Cho et al. and U.S. Patent 4,443,361 to Hierholzer et al.**

In regards to Claims 1, 10, 13, 16, and 17, Colombo (Figure 1; Column 2, line 30 - Column 4, Line 7) teaches a method of making an effusion cell for a vacuum

deposition system, the effusion cell comprising a self-supporting, serpentine filament 18; a cylindrical or annular heat shield (housing 20, which may be considered as a heat shield, as it falls in the path of radiation from the filament; Figure 1) spaced apart from and enclosing the filament; a supporting base plate 22; and a crucible 28 disposed radially inward of the heating filament and designed to retain material (Column 1, Lines 57-60). In regards to Claim 18, Colombo teaches a method of using the effusion cell, comprising heating the filament. (Column 3, Lines 18-31)

Further in regards to Claims 1, 16, 17, and 18, Colombo does not expressly teach that the housing 20 acts as a heat shield. Colombo does not expressly teach that the space between the filament and the heat shield is maintained by a plurality of electrical insulators.

Cho et al. teaches, in an effusion cell, that a heat shield 48.5 surrounds a filament 48.3, and that a space between a filament 48.3 and a heat shield 48.5 is maintained by a set of aluminum oxide rods 48.4, around which the heat shield is wrapped. (See at least Figures 3 and 4; Column 4, Lines 55-68) Cho et al. teaches that the rods 48.4 press the filament 48.3 against the crucible 48.2 to be heated.

Examiner takes official notice that aluminum oxide is an electrical insulator.

It would have been obvious to one of ordinary skill in the art to modify the housing of Colombo, which surrounds the filament, to alternatively positively form it of a material that will act as a heat shield, as taught Cho et al., for the predictable result of directing heat back to the crucible for heating the material to be evaporated, and thereby increasing the efficiency of the device.

It would have been obvious to one of ordinary skill in the art to modify the effusion cell of Colombo to include a set of aluminum oxide rods to maintain a space between the filament and the heat shield, as suggested by the teachings of Cho et al. One of ordinary skill in the art would have been motivated to make such a modification in order to press the filament against the crucible, giving a better heat transfer to the crucible. One of ordinary skill in the art would further recognize the predictable and desirable result of preventing an electrical short between the filament and the heat shield by the presence of the electrically insulating rods.

Further in regards to Claims 1, 16, 17, and 18, and in regards to Claims 2 and 3, Colombo does not expressly teach that the filament is a SiC filament that is comprised of an inner porous SiC material and an outer CVD-deposited layer of densified SiC with low porosity.

Hierholzer et al. teaches a heater filament comprising an inner porous SiC material, an outer CVD-deposited layer of densified SiC with low porosity, and a final layer of insulating ceramic such as silicon nitride. (See at least Column 1, Line 53 - Column 2, Line 17; Column 4, Lines 62-66; Column 6, Lines 23-24)

It would have been obvious to one of ordinary skill in the art to alternatively substitute a heater filament comprising an inner porous SiC material, an outer CVD-deposited layer of densified SiC with low porosity, and a final layer of insulating ceramic such as silicon nitride, as taught by Hierholzer et al., in the effusion cell of Colombo, as an art-recognized equivalent heating filament. It has been held that an express suggestion to substitute one equivalent component or process for another is not

necessary to render such substitution obvious. *In re Fout*, 675 F.2d 297, 213 USPQ 532 (CCPA 1982). Moreover, one of ordinary skill in the art would have been motivated to use the filament construction of Hierholzer et al. by the teachings that such filament is strong, forms little quartz at high temperatures, and is given to a narrower range of change in temperature with changes in voltage. (Hierholzer et al., Column 1, Lines 59-66)

In regards to Claim 9, Colombo teaches that the filament provides substantially uniform radiation when the electrical current passes therethrough. (Column 3, Lines 20-23)

In regards to Claims 11 and 12, Colombo does not expressly teach that the heat shield is conical or partially spherical. However, the shape of the heat shield would have been an obvious matter of design choice to one of ordinary skill in the art.

In regards to Claim 14, Colombo teaches that the filament 18 extends along a cylindrical contour. (Column 2, Lines 66-67)

**10. Claims 4 and 5 are rejected under 35 U.S.C. 103(a) as being unpatentable over Colombo in view of Cho et al. and Hierholzer et al. as applied to Claims 1-3 above, and further in view of Japanese Kokai 05-135858 to Kimura. The following rejection refers to the English Machine Translation (EMT) of Kimura.**

The teachings of Colombo in view of Cho et al. and Hierholzer et al. were discussed above in regards to Claims 1-3. Specifically, the combination of Colombo, Cho et al., and Hierholzer et al. teaches that the heating filament can have an outermost layer of insulating ceramic, such as silicon nitride.



In regards to Claims 4 and 5, the combination of Colombo, Cho et al., and Hierholzer et al. does not expressly teach that the insulating ceramic can be a material recited in the claims.

Kimura teaches that a ceramic layer for giving oxidative resistance to a heating filament may alternatively be silicon nitride or boron nitride. (EMT, Paragraph 12)

It would have been obvious to one of ordinary skill in the art to modify the combination of Colombo, Cho et al., and Hierholzer et al. to alternatively select boron nitride as the outermost ceramic layer for the heating filament, as an art-recognized suitable and equivalent material for coating the filament and providing oxidative resistance, as taught by Kimura. It has been held that the selection of a known material based on its suitability for its intended use is *prima facie* obviousness. *Sinclair & Carroll Co. v. Interchemical Corp.*, 325 U.S. 327, 65 USPQ 297 (1945).

**11. Claims 6-8 and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Colombo in view of Cho et al. and Hierholzer et al. as applied to Claim 1 above, and further in view of U.S. Patent 6,162,300 to Bichrt.**

The teachings of Colombo in view of Cho et al. and Hierholzer et al. were discussed above in regards to Claim 1.

The combination of Colombo, Cho et al. and Hierholzer et al. does not expressly teach that the heat shield should comprise a ceramic (SiC or PBN), or a ceramic coated in metal, or that the base plate should comprise SiC or PBN.

Bichrt (Column 4, Lines 21-55) teaches that the housing of an effusion cell can be constructed of any metallic or ceramic material or composite thereof able to

withstand the heat and pressure an effusion cell is subject to, and gives PBN and SiC as examples of such materials.

Thus, it would have been obvious to one of ordinary skill in the art, in the combination of Colombo, Cho et al., and Hierholzer et al., to select to form the heat shield of a ceramic (SiC or PBN), or a ceramic coated in metal, and the base plate of SiC or PBN, as art-recognized suitable materials for use in constructing the parts of the effusion cell and to give those elements heat and pressure resistance, as suggested by the teachings of Bichrt.

**12. Claims 11 and 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Colombo in view of Cho et al. and Hierholzer et al. as applied to Claim 1 above, and further in view of U.S. Patent 5,034,604 to Streetman et al.**

The teachings of Colombo in view of Cho et al. and Hierholzer et al. were discussed above in regards to Claim 1.

The combination of Colombo, Cho et al. and Hierholzer et al. does not expressly teach that the heat shield is conical or partially spherical.

Streetman et al. teaches that a heat shield 4 for an effusion cell can be made of a ductile material, can be positioned in conformity to the outside structure of the crucible of the effusion cell, and can be conical in shape (Figure 1c). (Column 2, Lines 68; Column 7, Lines 20-41)

It would have been obvious to one of ordinary skill in the art to modify the teachings of Colombo, Cho et al. and Hierholzer et al. to form the heat shield of a ductile material, as taught by Streetman et al., for the predictable result of allowing it to

be shaped and to reflect heat from any particular spot outside the crucible. It further would have been obvious to one of ordinary skill in the art to select to form the heat shield with a conical or partially spherical shape as a matter of choice, in order to conform as desired to a crucible in the effusion cell and to reflect heat from any particular spot outside the crucible.

### ***Conclusion***

13. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Maureen Gramaglia whose telephone number is (571)272-1219. The examiner can normally be reached on core hours of 10-5, Monday-Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Parviz Hassanzadeh can be reached on (571) 272-1435. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Maureen Gramaglia/  
Examiner, Art Unit 1792

/Parviz Hassanzadeh/  
Supervisory Patent Examiner, Art Unit 1792